**Supplementary Table 1a**: Summary table for TCGA and Rembrandt patient MRI parameters such slice thickness/gap, field strength, and in-plane voxel size.

|  |  |
| --- | --- |
|  | TCGA (N=79 patients) |
| Scanner Strength (Tesla)1.01.53.0Not Available | 1 (1.26%)47 (59.4%)26 (32.9%)5 (6.32%) |
|  | **AX T1 POST** | **AX FLAIR** |
| In-plane Voxel size (mm) | 0.430 – 1.016 | 0.410 – 0.977 |
| Slice Thickness (mm) | 1.000 – 8.249 | 2.500 – 8.250 |
| Gap (mm) | 1.000 – 7.500 (9 Not Available) | 2.000 – 7.500 (4 Not Available) |

|  |  |
| --- | --- |
|  | Rembrandt (N=14patients) |
| Scanner Strength (Tesla)1.5Not Available | 10 (71.5%)4 (28.5%) |
|  | **AX T1 POST** | **AX FLAIR** |
| In-plane Voxel size (mm) | 0.781 – 0.987 | 0.429 – 0.938 |
| Slice Thickness (mm) | 3.000 – 5.200 | 3.000 – 5.000 |
| Gap (mm) | 2.500 – 7.500  | 2.500 – 6.000 |

**Supplementary Table 1b:** Per patient summary table for TCGA and Rembrandt patient MRI parameters such slice thickness/gap, field strength, and in-plane voxel size.

|  |  |  |  |
| --- | --- | --- | --- |
| ID | Magnetic Field | AX T1 POST | AX FLAIR |
| **Strength (Tesla)** | **Gap (mm)** | **in plane voxel size (mm)** | **slice thickness (mm)** | **Gap (mm)** | **in plane voxel size (mm)** | **slice thickness (mm)** |
| 1 | 1.49 | 1 | 0.859375 | 7.4999986 | 2.5 | 0.8984375 | 7.5 |
| 2 | 1.5 | 1.5 | 1.015625 | 1.5 | 5 | 0.859375 | 5 |
| 3 | 1.49 | 2 | 0.9375 | 7.0000081 | 2 | 0.9375 | 7.0000081 |
| 4 | 3 | 2.5 | 0.4688 | 1 | 2.5 | 0.4688 | 2.5 |
| 5 | 3 | 2.5 | 0.46875 | 2.5 | 2.5 | 0.46875 | 2.5 |
| 6 | 3 | 2.5 | 0.46875 | 2.5 | 2.5 | 0.46875 | 2.5 |
| 7 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 8 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 9 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 10 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 11 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 12 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 13 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 14 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 15 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 16 | 1.5 | 2.5 | 0.9375 | 2.5 | 2.5 | 0.9375 | 2.5 |
| 17 | 1.5 | 2.5 | 0.9375 | 2.5 | 2.5 | 0.9375 | 2.5 |
| 18 | 1.5 | 2.5 | 0.9375 | 2.5 | 2.5 | 0.9375 | 2.5 |
| 19 | 1.5 | 2.5 | 0.9375 | 2.5 | 2.5 | 0.9375 | 2.5 |
| 20 | 1.5 | 2.5 | 0.9375 | 2.5 | 2.5 | 0.9375 | 2.5 |
| 21 | 1.49 | 2.5 | 0.859375 | 7.5 | 2.5 | 0.8203125 | 7.5 |
| 22 | 1.49 | 2.5 | 0.859375 | 7.5000038 | 2.5 | 0.859375 | 7.5 |
| 23 | 1.5 | 3 | 0.9375 | 3 | 3 | 0.9375 | 3 |
| 24 | 1.5 | 3 | 0.9375 | 3 | 3 | 0.9375 | 3 |
| 25 | 1.5 | 3 | 0.9375 | 3 | 3 | 0.9375 | 3 |
| 26 | 1.5 | 3 | 0.9375 | 3 | 3 | 0.9375 | 3 |
| 27 | NA | 3 | 0.938 | 3 | 3 | 0.938 | 3 |
| 28 | 3 | 4.52 | 0.71875 | 4.5200028 | 4.52 | 0.8984375 | 4.5200028 |
| 29 | 3 | 5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |
| 30 | 3 | 5 | 0.4688 | 5 | 2.5 | 0.4688 | 2.5 |
| 31 | 3 | 5 | 0.4688 | 5 | 2.5 | 0.4688 | 2.5 |
| 32 | 3 | 5 | 0.75 | 5 | 6 | 0.6818182 | 5.9999938 |
| 33 | 3 | 5 | 0.71875 | 5.0000014 | 6 | 0.685 | 5.9999986 |
| 34 | 1.5 | 5 | 0.429687 | 5.0000162 | 5 | 0.859374 | 4.9999585 |
| 35 | 1.5 | 5.5 | 0.8984375 | 5.499999 | 5.5 | 0.8984375 | 5.499999 |
| 36 | 1.5 | 6 | 0.859375 | 5.9076233 | 5 | 0.859375 | 5.0009999 |
| 37 | 1 | 6 | 0.8984375 | 5.9999981 | 6 | 0.8984375 | 5.9999995 |
| 38 | 1.5 | 6 | 0.4688 | 5.9999986 | 6 | 0.46875 | 6.0000978 |
| 39 | 3 | 6 | 0.8203125 | 5.999999 | 6 | 0.4101563 | 5.999999 |
| 40 | 1.5 | 6 | 0.4492188 | 5.999999 | 6 | 0.4492188 | 5.999999 |
| 41 | 1.5 | 6 | 0.4492188 | 6 | 6 | 0.4492188 | 6 |
| 42 | 1.5 | 6 | 0.4492188 | 6.0000014 | 5 | 0.9375 | 5 |
| 43 | 1.5 | 6.5 | 0.859383 | 6.4999361 | 6.5 | 0.859383 | 6.4999361 |
| 44 | 1.49 | 6.5 | 0.8984375 | 6.4999986 | 6 | 0.8984375 | 5.9999995 |
| 45 | 3 | 6.5 | 0.46875 | 6.5 | 6.5 | 0.46875 | 6.5 |
| 46 | 3 | 6.5 | 0.46875 | 6.5 | 6.5 | 0.46875 | 6.5 |
| 47 | 3 | 6.5 | 0.46875 | 6.5 | 6.5 | 0.46875 | 6.5 |
| 48 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 49 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 50 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 51 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 52 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 53 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 54 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 55 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 56 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 57 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 58 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 59 | 1.5 | 6.5 | 0.78125 | 6.5 | 6.5 | 0.78125 | 6.5 |
| 60 | 3 | 6.5 | 0.859375 | 6.5 | 6.5 | 0.859375 | 6.5 |
| 61 | 1.494 | 6.5 | 0.4492188 | 6.500001 | 6.5 | 0.5989583 | 6.5000014 |
| 62 | 3 | 6.5 | 0.859375 | 6.5000648 | 6.5 | 0.859375 | 6.5000648 |
| 63 | 1.5 | 7 | 0.9570313 | 7.0000005 | 7 | 0.9570313 | 7.0000005 |
| 64 | 1.5 | 7.25 | 0.8984375 | 7.2500005 | 7.25 | 0.8984375 | 7.2500005 |
| 65 | 2.89362 | 7.5 | 0.5729167 | 7.499999 | 7.5 | 0.6875 | 7.499999 |
| 66 | 1.49 | NA | 0.5078125 | 1.5 | 2.5 | 0.859375 | 7.5 |
| 67 | 1.49 | NA | 0.4882813 | 2 | 6.25 | 0.4492188 | 6.25 |
| 68 | 1.5 | NA | 0.9375 | 3 | 3 | 0.9375 | 3 |
| 69 | NA | NA | 0.938 | 3 | NA | 0.938 | 3 |
| 70 | NA | NA | 0.938 | 3 | NA | 0.938 | 3 |
| 71 | NA | NA | 0.938 | 3 | NA | 0.938 | 3 |
| 72 | NA | NA | 0.938 | 3 | NA | 0.938 | 3 |
| 73 | 1.49 | NA | 0.859375 | 7.5000052 | 2.5 | 0.859375 | 7.5000038 |
| 74 | 1.49 | NA | 0.9765625 | 8.2499866 | 3.25 | 0.9765625 | 8.2499866 |
| 75 | 1.5 | 3 | 0.93750 | 3 | 3 | 0.93750 | 3 |
| 76 | 1.5 | 3 | 0.93750 | 3 | 3 | 0.93750 | 3 |
| 77 | 1.5 | 7.5 | 0.89843 | 5 | 7.5 | 0.89843 | 5 |
| 78 | 1.5 | 7 | 0.89843 | 5 | 7 | 0.89843 | 5 |
| 79 | 3 | 2.5 | 0.4688 | 2.5 | 2.5 | 0.4688 | 2.5 |

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Magnetic Field** | **AX T1 POST** | **AX FLAIR** |
| **Strength (Tesla)** | **Gap (mm)** | **in plane voxel size (mm)** | **slice thickness (mm)** | **Gap (mm)** | **in plane voxel size (mm)** | **slice thickness (mm)** |
| **1** | 1.5 | 2.5 | 0.8593750 | 5 | 2.5 | 0.8593750 | 5 |
| **2** | 1.5 | 7.5 | 0.8593750 | 5 | 6 | 0.8593750 | 5 |
| **3** | 1.5 | 2.5 | 0.8593750 | 5 | 2.5 | 0.8984375 | 5 |
| **4** | 1.5 | 2.5 | 0.8593750 | 5 | 2.5 | 0.4296875 | 5 |
| **5** | 1.5 | 2.5 | 0.8593750 | 5 | 2.5 | 0.8203125 | 5 |
| **6** | 1.5 | 2.6 | 0.9375 | 5.2 | 6 | 0.859375 | 5 |
| **7** | 1.5 | 7.5 | 0.78125 | 5 | 6 | 0.78125 | 5 |
| **8** | 1.5 | 5 | 0.781250 | 4 | 3 | 0.781250 | 3 |
| **9** | NA | 3 | 0.938 | 3 | 3 | 0.938 | 3 |
| **10** | NA | 3 | 0.938 | 3 | 3 | 0.938 | 3 |
| **11** | NA | 3 | 0.938 | 3 | 3 | 0.938 | 3 |
| **12** | NA | 3 | 0.94 | 3 | 3 | 0.938 | 3 |
| **13** | 1.5 | 3 | 0.937 | 3 | 3 | 0.937 | 3 |
| **14** | 1.5 | 3 | 0.937 | 3 | 3 | 0.937 | 3 |

**Supplementary Table 2:** Significantly associated MRI derived texture features with *POSTN* gene expression in mice.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S. No. | Feature Selected | Level | Volume Normalization | Invariance Metric | Feature Name |
| 1 | ed\_F297 | 256 |  | angular variance | Information Measure of correlation 1 |
| 2 | GBMV\_F236 | 64 | Y | angular variance | Difference Entropy |
| 3 | ed\_F276 | 256 |  | range | Difference Entropy |
| 4 | en\_F257 | 256 |  | mean | Information Measure of correlation 1 |
| 5 | ed\_F274 | 256 |  | range | Sum Entropy |
| 6 | edV\_F45 | 8 | Y | angular variance | Cluster Shade |
| 7 | enV\_F124 | 32 | Y | mean | Cluster Prominence |
| 8 | ed\_F125 | 32 |  | mean | Cluster Shade |
| 9 | edV\_F216 | 64 | Y | range | Difference Entropy |
| 10 | en\_F84 | 16 |  | range | Cluster Prominence |
| 11 | edV\_T70 | 16 | Y | mean | Maximum Probability |
| 12 | ed\_F2 | 8 |  | mean | Contrast |
| 13 | GBMFO\_F1 |  |  |  | Minimum |
| 14 | ed\_F90 | 16 |  | range | Maximum Probability |
| 15 | ed\_F7 | 8 |  | mean | Energy |
| 16 | GBM\_F77 | 16 |  | mean | Information Measure of correlation 1 |
| 17 | ed\_F45 | 8 |  | angular variance | Cluster Shade |

Features with ‘fo’ in ‘Feature selected’ column represent features from first order statistics.

**Supplementary Table 3:** Significantly associated MRI derived texture features with *POSTN* gene expression in TCGA and Rembrandt patients.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S. No. | Features Selected | Level | Volume Normalization | Invariant Metric | Feature Name |
| 1 | necV\_T142 | 32 | Y | range | Contrast |
| 2 | necV\_T213 | 64 | Y | range | Sum Variance |
| 3 | nec\_T255 | 256 |  | average | Difference Entropy |
| 4 | necV\_T113 | 16 | Y | angular variance | Sum Variance |
| 5 | nec\_F216 | 64 |  | range | Difference Entropy |
| 6 | enV\_T247 | 256 | Y | average | Energy |
| 7 | nec\_F116 | 16 |  | angular variance | Difference Entropy |
| 8 | ed\_T174 | 32 |  | angular variance | Sum Entropy |
| 9 | en\_T246 | 256 |  | average | Dissimilarity |
| 10 | edFO\_F10 |  |  |  | Kurtosis |
| 11 | en\_T249 | 256 |  | average | Homogeneity |
| 12 | GBMFO\_T9 |  |  |  | Skweness |
| 13 | edV\_F29 | 8 | Y | range | Homogeneity |
| 14 | nec\_T159 | 32 |  | range | Inverse difference normalized (INN) |
| 15 | edV\_T163 | 32 | Y | angular variance | Correlation |
| 16 | ed\_T10 | 8 |  | average | Maximum Probability |
| 17 | nec\_F32 | 8 |  | range | Sum Average |
| 18 | GBM\_T150 | 32 |  | range | Maximum Probability |
| 19 | GBMV\_T63 | 16 | Y | average | Correlation |
| 20 | ed\_F169 | 32 |  | angular variance | Homogeneity |
| 21 | ed\_F7 | 8 |  | average | Energy |
| 22 | GBM\_T151 | 32 |  | range | Sum of squares: Variance |
| 23 | ed\_F146 | 32 |  | range | Dissimilarity |
| 24 | GBMV\_F29 | 8 | Y | range | Homogeneity |
| 25 | GBMV\_F274 | 256 | Y | range | Sum Entropy |
| 26 | enFO\_F2 |  |  |  | Maximum |
| 27 | GBMV\_F47 | 8 | Y | angular variance | Energy |
| 28 | enV\_T169 | 32 | Y | angular variance | Homogeneity |
| 29 | enV\_T123 | 32 | Y | average | Correlation |
| 30 | ed\_T181 | 64 |  | average | Autocorrelation |
| 31 | ed\_F21 | 8 |  | range | Autocorrelation |
| 32 | enV\_T16 | 8 | Y | average | Difference Entropy |
| 33 | nec\_F5 | 8 |  | average | Cluster Shade |
| 34 | edV\_T45 | 8 | Y | angular variance | Cluster Shade |
| 35 | necFO\_F9 |  |  |  | Skewness |
| 36 | necV\_T269 | 256 | Y | range | Homogeneity |
| 37 | edV\_T269 | 256 | Y | range | Homogeneity |
| 38 | enV\_T3 | 8 | Y | average | Correlation |
| 39 | en\_F86 | 16 |  | range | Dissimilarity |
| 40 | en\_F67 | 16 |  | average | Energy |
| 41 | nec\_T122 | 32 |  | average | Contrast |
| 42 | ed\_F257 | 256 |  | average | Information measure of correlation 1 |
| 43 | edFO\_F4 |  |  |  |  |
| 44 | ed\_F100 | 16 |  | angular variance | Inverse difference moment normalized |
| 45 | necFO\_T7 |  |  |  |  |
| 46 | necV\_F256 | 256 | Y | average | Difference Entropy |
| 47 | necV\_F262 | 256 | Y | range | Contrast |
| 48 | en\_T44 | 8 |  | angular variance | Cluster Prominence |

Features with ‘FO’ in ‘Feature selected’ column represent features from first order statistics.